

Amendment to the Claims:

1. (Currently Amended) A method for sequentially injecting a molten material comprising:

clamping a stationary platen and a movable platen at a clamping force to define at least two mold cavities;

injecting a molten material into a first mold cavity at a fill rate to fill and pack said cavity with said molten material, said molten material being injected into said first mold cavity by an injection pressure that is applied to said molten material;

holding molten material in said first mold cavity;

injecting molten material into a second mold cavity to fill and pack said cavity with said molten material; and

holding molten material in said second mold cavity,

wherein the injection pressure that is applied to the molten material during the step of injecting the molten material into the first mold cavity is reduced before commencing the step of injecting the molten material into the second mold cavity.

2. (Original) The method of claim 1 wherein molten material is held in said mold cavities at said clamping pressure until said material cools and solidifies into molten articles.

3 (Original) The method of claim 1 wherein a hydraulic cylinder, toggle, or electric machine is used to clamp the stationary platen and the movable platen at said clamping force.

4. (Original) The method of claim 1 wherein a valve gate faces each of said mold cavities.

5. (Original) The method of claim 4 wherein the valve gates are controlled independently of each other by a control unit.

6. (Original) The method of claim 1 wherein the amount of molten material injected into said cavity is monitored by a control unit that receives signals from a stroke sensor associated with a resin feeding screw.

7. (Original) The method of claim 1 wherein the mold cavities are multi-gate mold cavities.

8. (Original) The method of claim 5 wherein the control unit starts and holds injection of molten material into said cavities based on signals transmitted by said stroke sensor or a timer or pressure switch to the control unit.

9. (Currently Amended) The method of claim 1 wherein the [flow] fill rate of injection of said molten material is reduced from a filling flow rate when molten material in said first cavity reaches a velocity to pressure switchover point and is then increased to the filling flow rate when said second mold cavity is injected with said molten material.

10. (Original) The method of claim 4 wherein said valve gate is closed when said molten material in said cavity reaches a velocity to pressure switchover point.

11. (Original) The method of claim 4 wherein said valve gate is closed when said molten material in said cavity has been held at a holding pressure for a period of time.

12. (Original) The method of claim 1 wherein no holding pressure is used during said steps of holding molten material inside said first and second cavities.

13. (Currently Amended) An injection molding apparatus comprising:

a mold having at least two mold cavities;

[an] a molten material inlet system in communication with said at least two mold cavities;

at least two valves in said molten material inlet, wherein each of said at least two valves are associated with one of said mold cavities; and

a controller adapted to sequentially inject molten material into said mold cavities,

wherein said controller is further adapted to regulate an injection pressure that is applied to the molten material, said injection pressure being substantially eliminated prior to the injection of molten material into each of said mold cavities.

14. (Currently Amended) The apparatus of claim [11] 13 wherein the mold cavities are multi-gate mold cavities.

15. (Currently Amended) The apparatus of claim [11] 13 further comprising a stationary platen and a movable platen adapted to apply a clamping pressure to said mold having said at least two mold cavities.

16. (Currently Amended) The apparatus of claim [11] 13 wherein said molten material inlet comprises at least two channels, each of said channels associated with one of said mold cavities, each of said channels in communication with and branching from a common inlet.

17. (Original) The apparatus of claim 16 wherein each of said channels includes a valve gate.

18. (Currently Amended) The apparatus of claim [11] 13 wherein a valve gate is associated with each of said inlets.

19. (Currently Amended) The apparatus of claim [11] 13 further comprising a clamping system, said clamping system applying a clamping pressure to said mold.

20. (Original) The apparatus of claim 19 wherein said clamping pressure is lower than the pressure that would be required by a non-sequential controller.

21. (Currently Amended) A controller for use with an injection molding device having a mold with at least two cavities, the controller comprising:

means for initiating a flow of molten material into a first mold cavity;

means for reducing the flow of molten material into said first cavity when said first mold cavity is substantially filled with molten material;[:]

means for initiating a flow of molten material into a second mold cavity; and

means for reducing the flow of molten material into said second cavity when said second mold cavity is substantially filled with molten material,

means for substantially eliminating an injection pressure applied to said molten material when said first mold cavity is substantially filled and prior to initiating the flow of molten material into said second cavity.

22. (Currently Amended) The controller of claim 21, wherein said means for initiating and reducing the flow of molten material is responsive to a stroke sensor associated with a resin feeding screw, a timer or a pressure transducer associated with the first mold cavity and the second mold cavity.

23. (Original) The controller of claim 21, wherein said mold cavities are multi-gate mold cavities.

24. (Currently Amended) The controller of claim 21 wherein the flow of molten material into said first and second mold cavities is reduced when said first or second mold cavity is substantially filled with molten material and said molten material is held inside said cavity at a holding pressure for a period of time.

25. (Currently Amended) A method for injection molding articles comprising the sequential steps of:

- a) providing an injection molding machine with a plurality of mold cavities;
- b) injecting a molten material into a first mold cavity at a first fill rate until the first mold cavity is substantially filled with molten material or until the molten material inside said first mold cavity reaches a set-point holding pressure;
- c) reducing or eliminating an injection pressure applied to said molten material;
- d) injecting said molten material into a second mold cavity at a second fill rate until the second mold cavity is substantially filled with molten material or until the molten material inside said second mold cavity reaches a set-point holding pressure;
- [d) repeating steps b)-c) until all of said plurality of mold cavities are filled with said molten material or are at the set-point holding pressure;]
- e) holding said molten material at said set-point pressure inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and
- f) ejecting said molded articles from said injection molding machine.

26. (Original) The method of claim 25 wherein molten material is held in said mold cavities at a clamping pressure until said material cools and solidifies into molded articles.

27. (Currently Amended) The method of claim 25 wherein a valve gate faces [at least one] each of said plurality of mold cavities.

28. (Original) The method of claim 27 wherein the valve gates are controlled independently of each other by a control unit.

29. (Original) The method of claim 25 wherein the pressure inside the mold cavities is measured by pressure transducers associated with said cavities.

30 (Original) The method of claim 25 wherein said fill rate is measured by a stroke sensor associated with a resin feeding screw.

31. (Original) The method of claim 25 wherein the mold cavities have multiple inlets.

32. (Original) The method of claim 28 wherein the control unit starts and holds injection of molten material into said cavities based on signals transmitted by one or both a stroke sensor or pressure transducer.

33. (Original) The method of claim 25 wherein said molten material is injected into said plurality of mold cavities by a resin feeding screw.

34. (Currently Amended) The method of claim 25, wherein the fill rate of injection of said molten material is reduced from a filling flow rate when the molten material in said first cavity is substantially full or reaches a holding pressure and is [then] subsequently increased to the filling flow rate when said second mold cavity is injected with said molten material.

35. (Currently Amended) A method for injection molding articles comprising:

a) providing an injection molding machine with a plurality of mold cavities and a resin feeding screw;

b) injecting a molten material into a first mold cavity at a first fill rate until said first mold cavity approaches a velocity to pressure switchover point, said molten material being injected by a first injection pressure that is applied to the molten material by the resin feeding screw;

c) reducing the first injection pressure that is applied to the molten material by the resin feeding screw;

d) injecting said molten material into a second mold cavity at a fill rate until the second mold cavity approaches a velocity to pressure switchover point, said molten material being injected by a second injection pressure that is applied to the molten material by the resin feeding screw;

[d) repeating steps b)-c) until all of said plurality of mold cavities are filled with said molten material;]

e) holding said molten material inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and

f) ejecting said molded articles from said injection molding machine.

36. (Original) The method of claim 35 wherein said molten material is injected into said plurality of mold cavities using the same resin feeding screw.

37. (Currently Amended) The method of claim 35 wherein prior to the step of injecting said molten material into [a] the second mold cavity, a valve gate associated with said second mold cavity is opened.

38. (Currently Amended) The method of claim [36] 35 wherein the step of reducing or eliminating the first injection pressure that is applied to the molten material by said resin feeding screw [is activated] has a duration of within about 0.5 seconds [after opening said valve gate].

39. (Currently Amended) A method for injection molding articles comprising:

a) providing an injection molding machine with a plurality of mold cavities and a resin feeding screw;

b) injecting a molten material into a first mold cavity at a first fill rate until said first mold cavity is substantially filled and said molten material is held at a holding pressure for a period of time, said molten material being injected by a first injection pressure that is applied to the molten material by the resin feeding screw;

c) closing said first mold cavity;

d) reducing the first injection pressure that is applied to the molten material by the resin feeding screw;

e) opening a second mold cavity;

[e)]f) injecting said molten material into a second mold cavity at a second fill rate until the second mold cavity is substantially filled and said molten material is held at a pressure for a period of time, said molten material being injected by a second injection pressure that is applied to the molten material by the resin feeding screw;

[f)]g) closing said second mold cavity;

[g) repeating steps b)-f) until all of said plurality of mold cavities are filled with said molten material;]

h) holding said molten material inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and

j) ejecting said molded articles from said injection molding machine [or a pressure switch].

40. (Original) The method of claim 39 wherein said molten material is injected into said plurality of mold cavities using said resin feeding screw.

41. (Currently Amended) The method of claim 40 wherein the step of reducing or eliminating the first injection pressure that is applied to the molten material by said resin feeding screw [is activated] has a duration of within about 0.5 seconds [after opening said second mold cavity].

42. (Currently Amended) A method for injection molding articles comprising:

a) providing an injection molding machine with a plurality of mold cavities, [and] a resin feeding screw, and a stroke sensor for monitoring the position of the resin feeding screw, the stroke sensor transmitting screw position data to a controller, wherein said resin feeding screw is at [in] a screw starting position, further wherein the controller indicates a first cavity starting position;

b) injecting a molten material into a first mold cavity at a first fill rate until said first mold cavity approaches a first velocity to pressure switchover point, wherein said resin feeding screw is at [an] a first cavity ending position at said switchover point, further wherein said controller indicates a first cavity filled position;

c) [moving] re-setting said [resin feeding screw back] controller from the first cavity filled position to [said] a second cavity starting position;

d) injecting a molten material into a second mold cavity at a second fill rate until said second mold cavity approaches a second velocity to pressure switchover point, wherein said resin feeding screw is at [an] a second cavity ending position at said switchover point, further wherein said controller indicates a second cavity filled position;

e) moving said resin feeding screw back to said screw starting position;

f) [repeating steps b)-e) until all of mold cavities are filled with said molten material;

g)] holding said molten material inside said plurality of mold cavities until said molten material cools and solidifies into molded articles; and

[h)]g) ejecting said molded articles from said injection molding machine.

43. (Newly added) The method of claim 1 wherein the injection pressure that is applied to the molten material during the step of injecting the molten material into the first mold cavity is substantially eliminated before commencing the step of injecting the molten material into the second mold cavity.

44. (Newly Added) The method of claim 35 wherein during step c), the first injection pressure that is applied to the molten material by the resin feeding screw is eliminated.

45. (Newly Added) The method of claim 39 wherein during step d), the first injection pressure that is applied to the molten material by the resin feeding screw is eliminated.